

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-195493

(43)Date of publication of application : 03.08.1993

(51)Int.Cl.

D21H 19/44

C08G 69/48

C09D133/06

D21H 21/50

(21)Application number : 04-034361

(22)Date of filing : 23.01.1992

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(54) COMPOSITION FOR COATING PAPER

(57)Abstract:

PURPOSE: To obtain the subject composition capable of providing coated paper excellent in coating operation efficiency, water resistant strength and ink receptivity.

CONSTITUTION: The objective composition for coating paper is characterized by including a carboxy-modified latex in an amount of 5-20 pts.wt. expressed in terms of solids and an alkali-soluble resin in an amount of 0.02-5 pts.wt. expressed in terms of the solids in 100 pts.wt. pigment.

LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The paper application constituent characterized by containing the alkali fusibility resin which melted the carboxy denaturation latex in 5 - 20 weight section and the alkaline-water solution by the solid content at a rate of 0.02 - 5 weight section by the solid content to the pigment 100 weight section.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention relates to the paper application constituent which gives the coated paper which was excellent in coating operation nature, and was excellent in a waterproof intensity and ink acceptance nature still in detail about the paper application constituent used for pigment coated paper.

[0002]

[Description of the Prior Art] Pigment coated paper is produced and consumed in large quantities from improving the gloss and printing picture image repeatability of own gloss of paper, a whiteness degree and smooth nature, or printed matter. Pigment coated paper applies the paper application constituent which contains a pigment and a binder in paper. As a pigment, the organic pigment formed from organic compounds, such as white inorganic pigments, such as Clay, a calcium carbonate, an aluminum hydroxide, a titanium dioxide, and a satin white, or polystyrene, is used, for example. As a binder, a carboxy denaturation latex is used as a main binder, and a starch, casein, soybean protein, etc. are used as a subbinder, for example.

[0003] An application constituent is applied to stencil paper in a manufacture of coated paper. As application equipment, the roll coater, the air knife coating machine, the bar coating machine, the blade coating machine, etc. are usually used. However, while the productivity was reduced in order for washing to take much a help and time, when an application constituent may have adhered to the various rolls attached to these coating machines and the affix was hard to be washed, when those affixes transfer to coated paper, it produces and cheats out of a defect to coated paper, and the big problem on a quality is produced.

[0004] On the other hand, the manufactured coated paper is printed and becomes commercial printed matter, such as a final publication and a final poster, a throwaway, and a catalog. As a printing method, offset printing is in use in recent years. In offset printing, since it wets and water is used, sufficient waterproof intensity is required of the coated paper which is a printing hand-ed. Moreover, in order to make repeatability of printing into sufficient thing, the outstanding ink acceptance nature is demanded.

[0005] When an application constituent adheres to the various rolls which are attached to a coating machine at the time of a coating, it is easy to be washed away with water, and it is required that washing nature is good. If this puts in another way, in the status that adhered to the roll etc. and it dried, it will be required that the durability of the paint film formed with the application constituent is low. On the other hand, a paper application constituent must be applied to stencil paper by the coating machine, and the coated paper obtained by drying this with a dryer succeedingly must hold the outstanding durability and outstanding ink acceptance nature. That is, it is asked for it being satisfied of the property which carried out phase conflict with a paper application constituent about durability.

[0006] In order to give durability and ink acceptance nature excellent in coated paper conventionally, the technique of adding a specific additive in an application constituent is performed widely. Such an additive is known as a printability improver, for example, a polyamide-formaldehyde resin (JP,44-116677,B), a polyamide-urea-epihalohydrin-formaldehyde resin (JP,61-42931,B), N-alkylation polyalkylene polyamine (JP,59-59996,A), etc. are proposed. Furthermore, the improvement by these further denaturation is shown in JP,1-132896,A, JP,2-216297,A, JP,2-216298,A, JP,2-221498,A, etc.

[0007] however, the above -- when the application constituent adheres to the various rolls attached to a coating machine etc., the paper application constituent using the well-known printability improver is inferior to washing nature, and affects operation nature. Moreover, it is asked for the further improvement also about the durability of coated paper and ink acceptance nature which were obtained.

[0008]

[Problem(s) to be Solved by the Invention] It is in the purpose of this invention offering the paper application constituent which gives the coated paper which was excellent in coating operation nature, and was excellent in a waterproof intensity and ink acceptance nature. This invention persons conquer the trouble of the aforementioned conventional technique, and improve the durability of coated paper, and ink acceptance nature further. When applying an application constituent to stencil paper by the coating machine collectively, as a result of inquiring zealously about the technique of improving the washing nature of the application constituent adhering to the various rolls attached to a coating machine, a pigment, By combining a carboxy denaturation latex and an alkali fusibility resin, it finds out that the aforementioned purpose can be attained and came to complete this invention.

[0009]

[Means for Solving the Problem] In this way, according to this invention, the paper application constituent characterized by

containing the alkali fusibility resin which melted the carboxy denaturation latex in 5 - 20 weight section and the alkaline-water solution by the solid content at a rate of 0.02 - 5 weight section by the solid content to the pigment 100 weight section is offered. [0010] Hereafter, this invention is explained in full detail. The paper application constituent of this invention is excellent in coating operation nature. That is, in case the coating of the application constituent is carried out to stencil paper by the coating machine, it has the outstanding washing nature by which the application constituent adhering to the various rolls attached to a coating machine is flushed easily with water. Moreover, the paper application constituent of this invention gives coated paper excellent in a waterproof intensity and ink acceptance nature. That is, the coated paper which applies the paper application constituent of this invention and is obtained has the outstanding durability and outstanding ink acceptance nature which are required of offset printing.

[0011] The well-known pigment which is not limited, for example, is used for coated paper, such as organic pigments, such as inorganic pigments, such as clay, a calcium carbonate, an aluminum hydroxide, a titanium dioxide, and a satin white, or polystyrene, especially as a pigment used in the paper application constituent of this invention is mentioned. These pigments are independent, respectively or can be used combining two or more sorts.

[0012] As a carboxy denaturation latex used by this invention, the carboxy denaturation synthesis copolymer latex generally used as a binder of a paper application constituent is mentioned. As an example of a carboxy denaturation latex For example, a carboxy denaturation styrene-butadiene copolymer latex, A carboxy denaturation methyl methacrylate-butadiene copolymer latex, A carboxy denaturation styrene-methylmethacrylate-butadiene copolymer latex, A carboxy denaturation styrene-acrylonitrile-butadiene copolymer latex, Carboxy denaturation synthetic rubber latexes, such as a carboxy denaturation styrene-methylmethacrylate-acrylonitrile-butadiene copolymer latex A carboxy denaturation acrylic-ester system, carboxy denaturation styrene acrylic-ester system latexes, two or more sorts of such mixture, etc. are mentioned.

[0013] Also of these carboxy denaturation latexes, the carboxy denaturation aromatic vinyl-aliphatic conjugated-diene system copolymer latex which contains an aromatic vinyl monomer and an aliphatic conjugated-diene monomer as a copolymerization component, for example, a carboxy denaturation styrene-butadiene system copolymer latex, is desirable, and the glass transition temperature of a less than 20-degree C thing is especially desirable.

[0014] Although the monomer used for synthesis of the carboxyl denaturation latex used for this invention and especially its composition are not limited, the monomer mixture which usually consists of 20 - 60 % of the weight of aliphatic conjugated-diene system monomers, 10 - 75 % of the weight of aromatic vinyl monomers, 0.5 - 20 % of the weight of ethylene system unsaturated-carboxylic-acid monomers, and 0 - 40 % of the weight of these monomers and other monomers which can be copolymerized is used.

[0015] Flexibility is given to a copolymer, when the amount is less than 20 % of the weight, a copolymer becomes hard too much, and conversely, since durability falls in exceeding 60 % of the weight, an aliphatic conjugated-diene system monomer is not desirable. As an example of an aliphatic conjugated-diene system monomer, although 1, three butadienes, the 2-methyl -1, three butadienes, 2-***** -1, three butadienes, two or more sorts of such mixture, etc. can be mentioned, especially 1 and 3 butadiene is desirable also of these.

[0016] By use of an aromatic vinyl monomer, the effect which gives the suitable hardness and suitable durability for a copolymer is acquired. Since a film plasticity will fall and an adhesive fall will occur if the amount cannot acquire effect sufficient at less than 10 % of the weight but exceeds 75 % of the weight conversely, it is not desirable. As an aromatic vinyl monomer, styrene, an alpha methyl styrene, mono-***** styrene, vinyltoluene, two or more sorts of such mixture, etc. can be illustrated, and especially styrene is desirable also of these.

[0017] An ethylene system unsaturated-carboxylic-acid monomer is used in order to raise the adhesive power of a copolymer and to improve the stability as colloid of a copolymer latex. At less than 0.5 % of the weight, the amount used will produce a problem at the stability at the time of a polymerization, if the above-mentioned effect is not fully acquired but exceeds 20 % of the weight conversely, or latex viscosity becomes high too much and problems, such as handling-coming to be hard, occur. As an example of an ethylene system unsaturated-carboxylic-acid monomer, an acrylic acid, a methacrylic acid, a crotonic acid, a cinnamic acid, an itaconic acid, a fumaric acid, a maleic acid, butene tricarboxylic acids, two or more sorts of such mixture, etc. are illustrated. Moreover, the unsaturation polycarboxylic-acid alkyl ester which has at least one carboxyl groups, such as itaconic-acid monoethyl ester, fumaric-acid monobutyl ester, and maleic-acid monobutyl ester, can be used.

[0018] As an example of each above-mentioned monomer and other monomers which can be copolymerized The alkyl ester; acrylonitrile of unsaturated carboxylic acids, such as a methyl acrylate, a methyl methacrylate, an ethyl acrylate, and a butyl acrylate Ethylene system nitril compound; acrylic-acid beta-hydroxyethyl, such as a methacrylonitrile, The hydroxyalkyl ester; acrylamide of unsaturated carboxylic acids, such as an acrylic-acid beta-hydroxy propyl and methacrylic-acid beta-hydroxyethyl The amide and its derivative; acrylic-acid ***** of unsaturated carboxylic acids, such as methacrylamide, N-methylol acrylamide, and diacetone acrylamide The glycidyl ester; methylamino ethyl (meta) acrylate of unsaturated carboxylic acids, such as a glycidyl methacrylate The vinyl compound of others, such as an amino alkyl ester; acrolein of ethylene system unsaturated carboxylic acids, such as t-butylamino ethyl (meta) acrylate, N, and N-dimethyl aminoethyl (meta) acrylate, allyl alcohol, and vinyl acetate, can be mentioned. These are independent, respectively or can be used combining two or more sorts.

[0019] The alkyl ester of a unsaturated carboxylic acid is used at 5 - 30% of the weight of a rate that it is effective in giving a moderate hydrophilic property, and preferably while it gives moderate hardness to a copolymer. Durability etc. will be affected if the amount used is excessive.

[0020] Ethylene system unsaturation nitril gives oil resistance to a copolymer, and an effect is to raise the printing gloss of coated paper, and it is 5 - 30 % of the weight preferably. It falls [a copolymer becomes hard too much or / the ink acceptance

nature of coated paper] and is not desirable if the amount used is excessive.

[0021] The hydroxyalkyl ester of a unsaturated carboxylic acid is effective on the stable disposition of a copolymer latex. An unsaturation carvone acid amide and its derivative are also effective on the stable disposition of a copolymer latex. When required, as for these monomers, it is desirable to use it in 40 or less % of the weight of the domain.

[0022] The alkali fusibility resin used in this invention is the copolymer resin which carries out copolymerization of an ethylene system unsaturated carboxylic acid, and an aromatic vinyl monomer and/or the monomer in which other copolymerization is possible, and is obtained, and is a resin melted in an alkaline-water solution. As for this copolymer resin, it is indispensable that it is an alkali fusibility.

[0023] Such an alkali fusibility resin can be manufactured by the technique currently indicated by JP,43-2460,B etc. It is indicated by JP,43-2460,B that an alkali fusibility resin is used for a pigment agent, an emulsifier, a film forming material, etc. And using an alkali fusibility resin as an emulsifier in an emulsion polymerization, and using the obtained copolymer aqueous resin variance object (namely, latex) for the covering constituent for press working of sheet metal is indicated by JP,1-97298,A.

[0024] Although it does not limit the monomer composition, in order to give an alkali fusibility, as for especially the alkali fusibility resin used for this invention, it is indispensable that an ethylene system unsaturated carboxylic acid is included as a monomer component. As an ethylene system unsaturated carboxylic acid, an acrylic acid, a methacrylic acid, a crotonic acid, a cinnamic acid, an itaconic acid, a fumaric acid, a maleic acid, butene tricarboxylic acids, two or more sorts of such mixture, etc. are illustrated, for example. They are an acrylic acid or a methacrylic acid preferably.

[0025] As a monomer by which copolymerization is carried out to the ethylene system unsaturated carboxylic acid which forms an alkali fusibility resin, an aromatic vinyl monomer, the alkyl ester of a unsaturated carboxylic acid, ethylene system unsaturation nitril, etc. are mentioned, for example. An aromatic vinyl monomer and the alkyl ester of a unsaturated carboxylic acid are used suitably. As an aromatic vinyl monomer, styrene, an alpha methyl styrene, mono-***** styrene, vinyltoluene, two or more sorts of such mixture, etc. are illustrated, and it is styrene preferably. As alkyl ester of a unsaturated carboxylic acid, a methyl acrylate, a methyl methacrylate, an ethyl acrylate, butyl acrylates, two or more sorts of such mixture, etc. are illustrated. The monomer in which other copolymerization is possible is used unless an alkali fusibility is checked.

[0026] The alkali fusibility resin which makes styrene and an acrylic acid (meta) a principal component is especially used suitably by this invention. The alkali fusibility resin which makes styrene and an acrylic acid (meta) a principal component is called alkali fusibility styrene acrylic resin.

[0027] In this invention, an alkali fusibility resin is used with the gestalt melted in the alkaline-water solution. As alkali used for an alkaline-water solution, for example, a sodium hydroxide, a potassium hydroxide, aqueous ammonia, an organic amine, a triethanolamine, a monoethanolamine, etc. are mentioned, and aqueous ammonia is desirable especially also of these.

[0028] Although especially the concentration of the alkaline-water solution melt of the alkali fusibility resin used by this invention is not limited, it is 5 - 40 % of the weight preferably. Since the concentration of an alkali fusibility resin causes a fall of coating concentration, if it, on the other hand, exceeds 40 % of the weight preferably at less than 5 % of the weight, since the viscosity of this alkaline-water solution will become high too much and addition will produce problems, such as becoming not easy, it is not desirable. Although it is not limited if it is sufficient amount for an alkali fusibility resin to melt the amount of the alkali added by the alkaline-water solution, the alkali addition of a domain from which pH of the obtained solution is set to 6-9 is desirable. It is desirable to add an alkali fusibility resin to the aqueous ammonia of concentration one to 10% of the weight, and to consider as the solution of 5 - 40 % of the weight of pitch concentration.

[0029] It is characterized by the paper application constituent of this invention containing 5 - 20 weight section and the alkaline-water solution melt of an alkali fusibility resin for a carboxy denaturation latex at a rate of 0.02 - 5 weight section by the solid content to the pigment 100 weight section at a solid content.

[0030] Durability with the blending ratio of coal (solid content) of a carboxy denaturation latex sufficient in under 5 weight section is not obtained, but on the other hand, if 20 weight section is exceeded, while the washing nature of a paint film will get worse and operation nature will fall, the ink acceptance nature of the obtained coated paper also falls. The desirable blending ratio of coal (solid content) of a carboxy denaturation latex is 5 - 17 weight section.

[0031] The blending ratio of coal (solid content) of an alkali fusibility resin cannot acquire a desired effect under in 0.02 weight section, and on the other hand, even if it exceeds 5 weight section, improvement of an effect is not seen. An alkali fusibility resin is added with the gestalt melted by the alkaline-water solution.

[0032] Especially the mixed technique of each component is not limited in this invention. For example, an alkali fusibility resin is beforehand mixed with a carboxy denaturation latex, and it is also mixable, after adding the mixed latex to a pigment, also being able to prepare a paper application constituent or adding to a pigment separately respectively. You may mix all components collectively. When mixing an alkali fusibility resin to a carboxy denaturation latex beforehand, an alkali fusibility resin is mixed with the gestalt melted by the alkaline-water solution.

[0033] The effect to the washing nature of a paint film, and the durability of coated paper and ink acceptance nature appears more notably than the case where the direction at the time of adding into pigment mixture and creating an application constituent added separately, respectively, and creates an application constituent, after mixing a carboxy denaturation latex and an alkali fusibility resin beforehand.

[0034] Various kinds of additives, such as water-soluble binders, such as a starch, casein, and soybean protein, a dispersant, pH modifier, a lubricant, a water retention agent, a defoaming agent, a color, a color pigment, a fluorescent dye, and antiseptics, can be blended with the paper application constituent of this invention by request with water, a pigment, a carboxy denaturation latex, and an alkali fusibility resin. Furthermore, a well-known printability improver can also be used together within limits

which do not check the purpose of this invention.

[0035] The paper in which a paper application constituent is applied does not limit the modality, and, of course, the paper board is also included. The application technique can be based on a well-known coating facility of an air knife coating machine, a roll coater, a bar coating machine, a blade coating machine, etc.

[0036]

[Example] Although an example and the example of a comparison are given and this invention is explained still concretely hereafter, this invention is not limited only to these examples. In addition, in these examples, the section and % are weight criteria, as long as there is no notice especially.

[0037] In addition, the measuring method of physical properties is as follows.

(1) Apply a washing nature application constituent to a polyester film with an applicator bar, and dry for 30 minutes at a room temperature. This film is immersed underwater, the status of 10 minutes after is observed, and the degree of lysis is judged in the following four phases.

O : -- perfect -- lysis and O : -- almost -- lysis and **: -- a part -- lysis -- don't do x:lysis of

[0038] (2) After having used RI printing testing machine [made in Dawn Factory] for waterproof coated paper and applying water to it with a mol ton roll, picking test ink (tackiness 18) was printed, and the occurrence status of a picking of a printing side was observed and judged. A five point method estimates and it is shown that the larger thing of a number has better durability. Evaluation of a five point method (waterproof mark) judged visually the proportion (rate of pick surface ratio) of the area which raised the pick by the following criteria, and performed it.

5: 0%, 4 : The excess of 0%, 25% or less, 3 : The excess of 25%, 50% or less, 2 : The excess of 50%, 75% or less, 1 : The excess of 75%, 100% or less.

[0039] (3) after giving water by the rubber covered roll which used RI printing testing machine [made in Dawn Factory] for ink acceptance nature coated paper, and applied water to it -- the Japanese ink ink for offset -- printing -- the ink concentration of a printing side -- a concentration meter -- it measured by :DS[by [Dainippon Screen Mfg. / Co., Ltd. / Co., Ltd.] DM-400], and ink acceptance nature was judged What has a large ink concentration value is excellent in ink acceptance nature.

[0040] The carboxy denaturation latex which consists of monomer composition of a total of the 100 sections of the [example 1] styrene 28 section, the methyl methacrylate 15 section, the acrylonitrile 10 section, the butadiene 44 section, the itaconic-acid 1 section, and the acrylic-acid 2 section was prepared according to the emulsion polymerization.

[0041] The polymerization of the alkali fusibility styrene acrylic resin which consists of monomer composition of a total of the 100 sections of the styrene 76 section and the acrylic-acid 24 section was carried out according to solution polymerization, and the solvent was removed and obtained. The obtained alkali fusibility styrene acrylic resin was melted in aqueous ammonia 5%, and the alkali fusibility styrene acrylic resin solution of 35% of pitch concentration was obtained.

[0042] The application constituent was obtained by the following application constituent combination. The alkali fusibility resin was added with the gestalt of the solution melted in the above-mentioned aqueous ammonia.

Clay (UW90, product made from *****) The 70 sections Calcium carbonate The 30 sections (car ***** 90, made in ***** Japan)

Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Carboxy denaturation latex The 11 sections (solid content)

Alkali fusibility styrene acrylic resin The 0.1 sections (solid content)

Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

The paper application constituent was prepared so that a total solid might become 62%.

[0043] The washing nature of the obtained paper application constituent was measured. The amount of 15g of one side coatings/m² applied the paper application constituent to the paper of fine quality of 60g/m², it dried, supercalender credit was performed further, and coated paper was obtained. The durability of coated paper and ink acceptance nature which were obtained were measured. The measurement result of washing nature, durability, and ink acceptance nature is shown in Table 1.

[0044] As a [example 2] alkali fusibility resin, except having used B-36 (the Johnson polymer incorporated company make, ***** krill; alkali fusibility styrene acrylic resin), the paper application constituent was prepared by the same technique as an example 1, and washing nature was measured. Coated paper was created like the example 1 and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0045] Except having made combination number of copies of an alkali fusibility resin into the 2.0 sections in the [example 3] example 2, the paper application constituent was prepared by the same technique as an example 2, and washing nature was measured. Coated paper was created like the example 1 and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0046] Among it, among the carboxy denaturation latex 100 section (solid content) given in the [example 4] example 1, the solution (35% of pitch concentration) 1.0 section (solid content) which melted B-36 (the Johnson polymer incorporated company make, ***** krill; alkali fusibility styrene acrylic resin) in aqueous ammonia 5% was added, it fully mixed, and the alkali fusibility resin inclusion carboxy denaturation latex was prepared among it.

[0047] By the following combination, the paper application constituent was prepared so that a total solid might become 62%.

Clay (UW90, product made from *****) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Satin white (SW, Shiroishi industrial company make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Alkali fusibility resin inclusion carboxy denaturation latex The 13 sections (solid content)

Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0048] The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1 using the application constituent, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1. In this example, it means that the alkali fusibility resin was added at a rate of the 0.129 sections to the pigment 100 section at the solid content.

[0049] The carboxy denaturation latex which consists of monomer composition of a total of the 100 sections of the [example 5] styrene 23 section, the methyl methacrylate 15 section, the acrylonitrile 10 section, the butadiene 48 section, the methacrylic-acid 2 section, and the acrylamide 2 section was prepared according to the emulsion polymerization.

[0050] Among it, among the carboxy denaturation ***** 100 obtained section (solid content), the solution (35% of pitch concentration) 0.5 section (solid content) which melted the ***** krill 678 (the Johnson polymer incorporated company make, ***** krill; alkali fusibility styrene acrylic resin) in aqueous ammonia 5% was added, it fully mixed, and the alkali fusibility resin inclusion carboxy denaturation latex was prepared among it.

[0051] By the following combination, the application constituent was prepared so that it might become 62% of total solids. Clay (UW90, product made from *****) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Titanium white (TIPAQUE W10, Ishihara Sangyo Kaisha, Ltd. make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Alkali fusibility resin inclusion carboxy denaturation latex The 13 sections (solid content)

Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0052] The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1 using the application constituent, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1. In this example, it means that the 0.065 sections of alkali fusibility resins were added by the solid content to the pigment 100 section.

[0053] Using the alkali fusibility resin inclusion carboxy denaturation latex of the [example 6] example 5, it prepared so that the amount of all solid one might become 62% about an application constituent by the following combination. In this example, ***** gap gin 636 (; polyamide polyurea system resin by Sumitomo Chemical Co., Ltd.) was blended as a printability improver.

Clay (UW90, product made from *****) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Titanium white (TIPAQUE W10, Ishihara Sangyo Kaisha, Ltd. make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Alkali fusibility resin inclusion carboxy denaturation latex The 13 sections (solid content)

***** gap gin 636 The 0.5 sections Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0054] The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1 using the application constituent, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0055] The carboxy denaturation latex which consists of monomer composition of the [example 7] styrene 33 section, the methyl-methacrylate 10 section, the acrylonitrile 10 section, the butadiene 44 section, the itaconic-acid 1 section, and the acrylic-acid 2 section was prepared according to the emulsion polymerization.

[0056] The polymerization of the alkali fusibility resin which consists of monomer composition of a total of the 100 sections of the styrene 51 section, the methyl-methacrylate 21 section, and the acrylic-acid 28 section was carried out according to solution polymerization, and the solvent was removed and obtained. The obtained alkali fusibility resin was melted in aqueous ammonia 5%, and the alkali fusibility styrene acrylic resin solution of 35% of pitch concentration was obtained.

[0057] The alkali fusibility resin solution 1.0 section (solid content) was added among the carboxy denaturation latex 100 section (solid content), it fully mixed, and the alkali fusibility resin inclusion carboxy denaturation latex was prepared.

[0058] By the following combination, the paper application constituent was prepared so that the amount of all solid one might become 62%:

Clay (UW90, product made from *****) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Satin white (SW, Shiroishi industrial company make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Alkali fusibility resin inclusion carboxy denaturation latex The 13 sections (solid content)

Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0059] The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1 using the application constituent, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0060] The carboxy denaturation latex which consists of monomer composition of the [example 8] styrene 38 section, the methyl-methacrylate 5 section, the acrylonitrile 5 section, the butadiene 48 section, the itaconic-acid 1 section, the acrylic-acid 1 section, and the acrylamide 2 section was prepared according to the emulsion polymerization.

[0061] The polymerization of the alkali fusibility resin which consists of monomer composition of a total of the 100 sections of the styrene 34 section, the methyl-methacrylate 23 section, and the acrylic-acid 43 section was carried out according to solution

polymerization, and the solvent was removed and obtained. The obtained alkali fusibility resin was melted in aqueous ammonia 5%, and the alkali fusibility styrene acrylic resin solution of 35% of pitch concentration was obtained.

[0062] The alkali fusibility resin solution 1.0 section (solid content) was added among the carboxy denaturation latex 100 section (solid content), it fully mixed, and the alkali fusibility resin inclusion carboxy denaturation latex was prepared.

[0063] By the following combination, the paper application constituent was prepared so that the amount of all solid one might become 62%.

Clay (UW90, product made from ***** Japan) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Satin white (SW, Shiroishi industrial company make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Alkali fusibility resin inclusion carboxy denaturation latex The 13 sections (solid content) Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0064] The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1 using the application constituent, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0065] [The example 1 of a comparison] (he has no alkali fusibility resin)

The application constituent was prepared by the following combination using the carboxy denaturation latex of an example 1.

Clay (UW90, product made from ***** Japan) The 70 sections Calcium carbonate The 30 sections (car ***** 90, made in ***** Japan)

Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Carboxy denaturation latex The 11 sections (solid content)

Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0066] The paper application constituent was prepared so that a total solid might become 62%. The washing nature of the obtained application constituent was measured. Coated paper was created by the same technique as an example 1, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0067] [The example 2 of a comparison] (he has no alkali fusibility resin)

The paper application constituent was prepared at 62% of total solids by the following combination using the carboxy denaturation latex of an example 1. In this example of a comparison, ***** gap gin 636 (the Sumitomo Chemical Co., Ltd. make, polyamide polyurea system resin) was blended as a printability improver.

Clay (UW90, product made from ***** Japan) The 70 sections Calcium carbonate The 30 sections (car ***** 90, made in ***** Japan)

Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Carboxy denaturation latex The 11 sections (solid content)

***** gap gin 636 The 0.1 sections Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0068] The washing nature of the obtained paper application constituent was measured. Coated paper was created by the same technique as an example 1, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0069] The paper application constituent was prepared by the following combination as a [example 3 of comparison] carboxy denaturation latex using the latex used in the example 5.

Clay (UW90, product made from ***** Japan) The 70 sections Calcium carbonate The 20 sections (car ***** 90, made in ***** Japan)

Titanium white (TIPAQUE W10, Ishihara Sangyo Kaisha, Ltd. make) The ten sections Dispersant (made in [**** synthetic-chemistry company] Aron T40) The 0.5 sections Carboxy denaturation latex The 13 sections (solid content) ***** gap gin 636 The 0.5 sections Oxidized starch The four sections (royal prince ace, royal prince corn-starch company make)

[0070] The washing nature of the obtained paper application constituent was measured. Coated paper was created by the same technique as an example 1, and durability and ink acceptance nature were measured. A measurement result is shown in Table 1.

[0071]

[Table 1]

	実 施 例								比 較 例		
	1	2	3	4	5	6	7	8	1	2	3
洗浄性	○	○	◎	◎	◎	○	◎	◎	×	×	×
耐水性	4	4	5	5	5	5	5	5	2	2	3
印刷受理性	0.65	0.63	0.74	0.71	0.69	0.72	0.68	0.70	0.35	0.40	0.51

[0072] Each paper application constituent of the example (examples 1-8) of this invention showed good washing nature, durability, and ink acceptance nature so that clearly from Table 1. Especially the paper application constituent of the examples

4-8 which mixed and used the alkali fusibility copolymer latex for the carboxy denaturation latex beforehand showed the outstanding effect. On the other hand, in the paper application constituent of the examples 1-3 of a comparison which have not blended the alkali fusibility resin, each was inferior to washing nature and durability and ink acceptance nature were also inferior. Also in the paper application constituent of the examples 2-3 of a comparison using the well-known printability improver, the improvement effect was acquired about neither the washing nature obtained in each example of this invention nor durability nor ink acceptance nature.

[0073]

[Effect of the Invention] According to this invention, the paper application constituent which gives the coated paper which was excellent in washing nature and was excellent in durability and ink acceptance nature is offered. If the paper application constituent of this invention is used, even if it adheres to the various rolls which are attached to a coating machine at the time of a coating, it will be easy to wash and the outstanding operation nature will be obtained. The coated paper which applied the paper application constituent of this invention shows the outstanding durability and outstanding ink acceptance nature, and is suitable for especially offset printing.

[Translation done.]